

## REMARKS

This amendment is being made pursuant to the Office Action mailed November 15, 2007. Claims 1-9, 11-21 and 24-36 remain pending in the application. Reconsideration and withdrawal of the all of the outstanding rejections is most respectfully requested.

### **Rejection Under 35 U.S.C. §103(a)**

#### **Rejection in View of Terasaka**

Claims 1-9, 11-21 and 24-36 stand rejected as being unpatentable over Terasaka et al. in view of herkules, and further in view of Yliopisto. Initially, the Examiner will note that the independent claims 1, 14 and 26 have been amended to highlight that the stress induced phase change property of the SMA particles is used to enhance the compression-after-impact strength of the underlying protective coating or paint. Again, it is strenuously yet respectfully asserted that this feature is not shown or suggested by the Terasaka et al., herkules and Yliopisto combination of references.

It is most respectfully asserted that the Examiner is ignoring an important distinction between the teachings of Teresaka et al. and the herkules and Yliopisto references. That distinction is that the functionality of the resin in Teresaka et al. would be destroyed if the general teachings of the herkules and Yliopisto references were applied thereto. That is because Teresaka et al. requires the particles 44 to be in their martensitic state to enable them to be "crushed" or deformed initially in the fabrication process, for the particles to perform their needed function. For the Teresaka et al. resin to function as it is desired to (i.e., to expand in response to a thermal change in the resin), the particles need to be able to return to a spherical

shape via the "shape memory effect" (temperature-induced martensite to austenite phase transformation). Put differently, when the resin in which the particles are encapsulated expands due to a change in humidity and/or temperature, which causes the connection terminals to be pushed upwardly in the drawing of Figure 4, the particles need to be able to "decompress". By having the particles compress into their martensitic state, this allows the particles 44 to expand in the thickness direction of the ACF, thus maintaining electrical conductivity between the connection terminals (col. 3, lines 5-19). Thus, applying the general teachings of herkules and Yliopisto as to stress induced phase change of the SMA particles (which the presently claimed resin relies on), to the resin of Teresaka et al., would provide no benefit to the resin in Teresaka et al., and furthermore would actually render the resin inoperable for its intended purpose. This is fundamentally different from the presently claimed protective coatings and paint, where the SMA particles need to be in their austenitic state when deployed in the protective coating or resin, and where the stress induced phase change property of the SMA particles is relied on to enhance the compression-after-impact strength of the coatings or paint.

Essentially what the Examiner has posited through the Teresaka et al., herkules, and Yliopisto rejection is that because the general stress induced and temperature induced phase change properties of SMA particles are known, it would have been obvious to modify the resin of Teresaka et al. to make use of the stress induced phase change properties of SMA particles in a protective coating in which SMA particles are present. Again, using the teachings of the secondary and tertiary references to modify Teresaka et al. would have destroyed the utility of Teresaka. The

Teresaka et al. resin would be entirely inoperable if the particles 44 were provided initially in their austenitic state. That is because the particles need to be able to thermally revert to their spherical configuration as the resin expands in order to perform their intended function of maintaining electrical conductivity between the connection terminals.

The Examiner has cited various paragraphs in Teresaka et al., principally in column 2, lines 65-67 and column 3, lines 1-10, to support an assertion that "stress induced" deformation is taught by Teresaka et al. However, this text merely underscores the fundamental difference between the presently claimed subject matter and that of Teresaka et al.: that the SMA particles are initially crushed by thermocompression, and therefore would not be able to provide any impact resistance to the resin in which they are suspended. This text further states that the SMA particles "remain in a compressed state due to stress acting thereon from the outside, and only revert to their initial state due to a stress acting thereon from the outside" (that stress being a temperature related stress acting on the resin).

There further does not appear to be any suggestion in any of the cited references of actually using the stress induced phase change property of SMA particles to enhance compression-after-impact strength of a protective coating or paint. This significant benefit and advancement only becomes apparent after reviewing the Applicant's own disclosure.

For at least the above set forth reasons, the undersigned continues to maintain that Teresaka et al. does not make use of a stress induced phase change of the materials to enhance a compression-after-impact strength of the underlying resin. In

view of the amendments to independent claims 1, 14 and 26, and the foregoing remarks, it is respectfully requested that the rejection in view of Teresaka et al., herkules and Yliopisto be withdrawn.


Claims 1-9, 11, 12, 14-21, 24, 26-33, 35 and 36 were rejected as being obvious over Yamakawa et al. (WO/03/102071; hereinafter "Yamakawa et al."). This rejection is also respectfully traversed. Yamakawa et al. is directed to a semiconductor that is manufactured in part with the use of a thermoconductive curable liquid polymer composition 5. The composition 5 is stated to function as a protective layer for the semiconductor element and as an adhesive agent for heat dissipation fins 6. The polymer 5 is stated to include a filler "B" made from a thermally elongatable shape memory alloy and a thermoconductive filler "C". The principal feature and function of the polymer is that it forms a good thermoconductive, curable liquid polymer with good flowability before curing, and good electrical conductivity after curing. Beyond a brief statement that the polymer 5 functions as a protective coating (which virtually any polymer coating would), there is no mention or suggestion that the polymer is able to provide any appreciable compression-after-impact strength, nor is being used for this purpose. Rather, it appears that just like with Teresaka et al., the SMA material is being used strictly to respond to temperature changes that the resin experiences and, in response to such temperature changes, to change shape to help maintain electrical conductivity between components that are covered by the resin. Thus, this reference, like Teresaka et al., appears to only make use of the thermal phase change property of the SMA particles. For at least this reason, reconsideration and withdrawal of this rejection is also respectfully requested.

### Conclusion

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated: February 15, 2008

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